

CLAIMS

What is Claimed Is:

1. An implantable stimulation lead system suitable for placement
5 inside the coronary sinus, the lead system comprising:

at least one electrode;

a lead body connected to the at least one electrode, the
lead body including at least a distal portion having at least two non-
helical bends dimensioned to passively anchor the distal portion of
10 the lead body in the coronary sinus;

wherein the at least two non-helical bends define
substantially an s-shaped portion so as to bias the at least two
non-helical bends against sides of a vessel wall in the coronary
sinus; and

15 wherein the at least one electrode is located distal of the
s-shaped portion and oriented towards the vessel wall.

2. The lead system, as defined in Claim 1, wherein the lead body
has a lumen therethrough, the lead system further comprising:

a stylet disposed and slidably movable within the lumen,
20 wherein:

when the stylet is partially withdrawn, the s-shaped portion
forms a steerable canted end; and

when the stylet is fully withdrawn, the s-shaped portion
passively anchors in a desired position.

25 3. The lead system, as defined in Claim 2, wherein the stylet
comprises a tapered portion which aids in tracking the coronary sinus.

4. The lead system, as defined in Claim 2, wherein:

the at least one electrode comprises a tip electrode; and
the steerable canted end orients the tip electrode toward the
patient's vessel wall.

5 5. The lead system, as defined in Claim 1, wherein the lead body
further comprises a ring electrode located at least one of before, after,
and on the at least two non-helical bends.

6. The lead system, as defined in Claim 2, wherein the at least
two non-helical bends are dimensioned to passively anchor the lead in at
10 least one of the coronary sinus vein, great cardiac vein, left marginal vein,
left posterior ventricular vein, and small cardiac vein.

7. The lead system, as recited in Claim 6, wherein the at least
two non-helical bends comprises a first bend located in the range of 0.15
- 0.7 inches from a distal end of the lead body.

15 8. The lead system, as recited in Claim 7, wherein the at least
two non-helical bends comprises a second bend located in the range of
0.15-0.7 inches from the first bend.

9. The lead system, as recited in Claim 6, wherein the at s-shaped
portion comprises a first hump and a second hump substantially in the
20 same geometric plane.

10. The lead system, as recited in Claim 6, wherein the s-shaped portion comprises a first hump and a second hump substantially in different geometric planes.

11. The lead system, as defined in Claim 1, wherein the s-shaped portion comprises a first hump and a second hump, each of the humps comprising two sides forming an angle in the range of about 30 - 150 degrees.

12. The lead system, as recited in Claim 1, further comprising a plurality of bends substantially in the same geometric plane.

13. The lead system, as recited in Claim 1, further comprising a plurality of bends substantially in a different geometric plane.

14. The lead system, as defined in Claim 1, wherein the lead body comprises a distal opening configured to receive a guidewire and allow the lead body to slide over the guidewire.

15. The lead system, as defined in Claim 1, wherein the lead body comprises an insulation layer having at least one textured region positioned on the surface of the insulation layer, the at least one textured region having increased surface area which passively anchors the lead body inside the coronary sinus.

16. The lead system, as defined in Claim 15, wherein the at least one textured region comprises a layer of expanded polytetrafluoroethylene (ePTFE).

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17. The lead system, as defined in Claim 15, wherein the at least one textured region comprises a layer of porous material having a plurality of pores, each of the plurality of pores being dimensioned to allow the penetration and growth of intravascular material therein.

A SELF-ANCHORING CORONARY SINUS LEAD

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Abstract of the Disclosure

An implantable cardiac lead system suitable for placement in the coronary sinus region of the heart. The lead system comprises a lead having two or more non-helical bends in its distal portion. The two or more non-helical bends cooperate to prevent the lead from dislodgment or displacement inside the coronary sinus. The lead system may further comprise a stylet suitable for steering the lead into at least one of the coronary sinus vein, great cardiac vein, left marginal vein, left posterior ventricular vein, and small cardiac vein. The stylet is tapered in its distal portion to provide enhanced maneuverability and steerability inside the coronary sinus region. The lead system may also comprise an introducer which aids in introducing the lead into the heart.

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